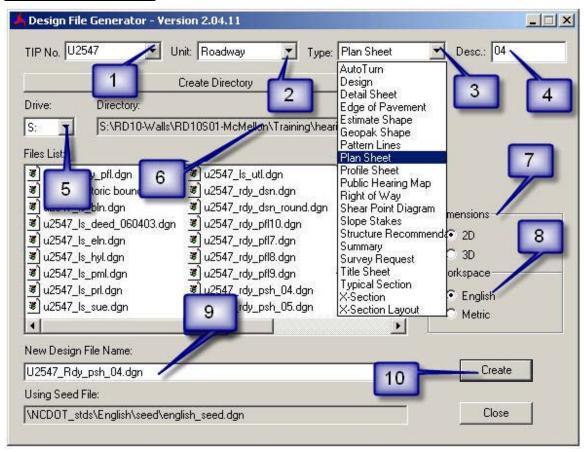
CHAPTER 3: PLAN COMPOSITION

Design File Generator



Design File Generator is an application that can be found in your application folder in the **NCDOT** workspace. This application will automatically name new design files for you w/o you having to remember all the rules and standards for file naming conventions.

- 1. Insert the **Tip Number**
- 2. Select the **Unit**
- 3. Select the **File Type**
- 4. Insert the **Description**
- 5. Select the **Drive**
- 6. Select **Directory**
- 7. Select the Type of File **Dimensions**
- 8. Select the **Workspace**
- 9. Shows You the **New Design File Name**
- 10. Click **Create** to Store New Design File in the Desired Location (Note: You can double click the file in the **Files list** to open it)

U-2547 rdy ps04.dgn

Note: Do **not** put dashes in the Tip Number and do **not**

combine the **Type** and **Description** together for example

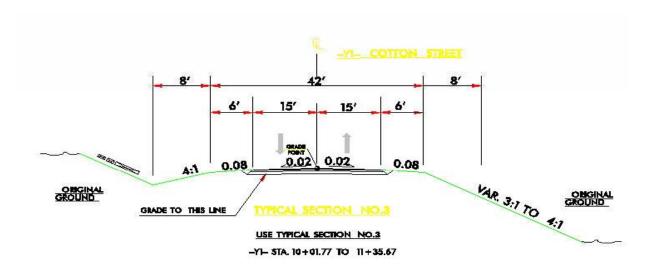
Exercise 1: Create the following Design Files in U2547 Roadway **Proj** folder: Plan Sheet Layout, Row, Slopestake, Design, Profile, in the Roadway **XSC** folder create the following X-section for **-Y-** X-Section Layout (XPL) for **-Y-** and a pattern line file for **-Y-**.

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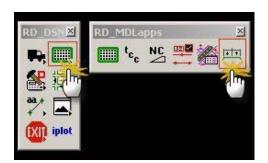
Typical Section Generator

Open the U2547_rdy_typ.dgn design file and verify you are in TOP VIEW.



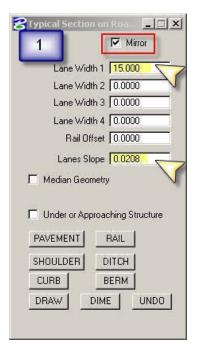


Typical Section Created Manually



From the **RD_DSN** Tool Frame pull off the **RD_MdLapps** Tool Family and select the **Typical Section Generator** Tool Box

Step 1. Lane Configuration

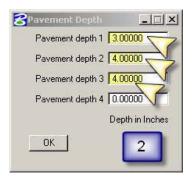


Note:

Check **on** the mirror tab to draw a symmetrical typical. Check **off** to draw a non-symmetrical typical.

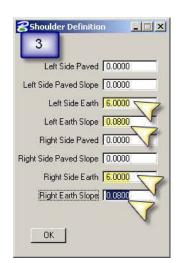
Populate the dialog boxes as shown

Step 2. Pavement Depth



Populate the dialog boxes as shown

Step 3. Shoulder Definition



Populate the dialog boxes as shown

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Step 4. Ditch Definition

Selecting the type of facility draws your ditch as shown in the Roadway Design Manual **Section 1-2A**. Set to **Local** for the **Right** ditch



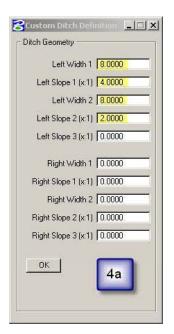
Selecting **CUSTOM** gives you the ability to customize your ditch definitions. Populate the **Left** Ditch as shown with settings on the right.

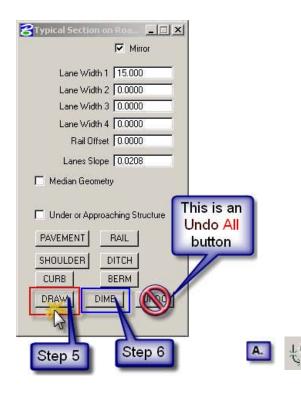
Step 5.

Draw the Typical

Step 6.

Dimensions the Typical





Notes:

The typicals are drawn in consecutive order from top to bottom.

The **UNDO** Button will **Undo All** changes, not just for the typical you are currently working on.

Notes on Scaling a Typical:

- (A.) Use the Drop tool box
- **(B.)** Check off Dimensions
- (C.) Select the entire typical using the Element Selector

C.

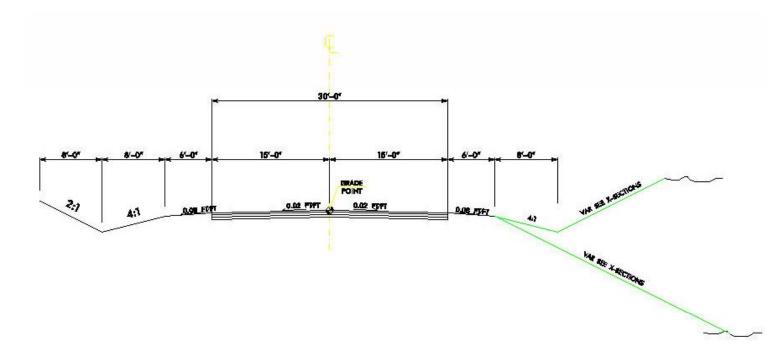
(D.) Scale your typical up or down





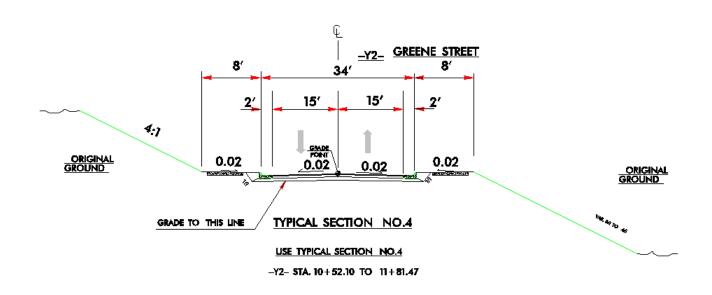


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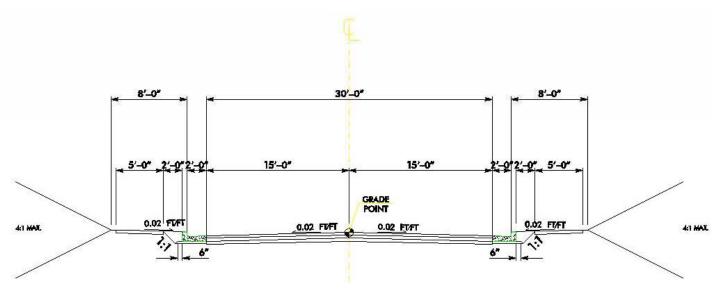


Finished Typical drawn with Typical Section Generator

Exercise 2: Draw the following typical using Typical Section Generator. Use the pavement design from the above example.



Typical Section Created Manually

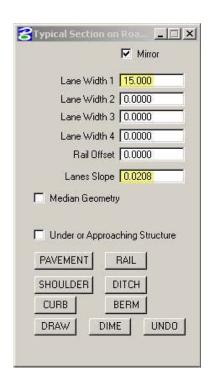


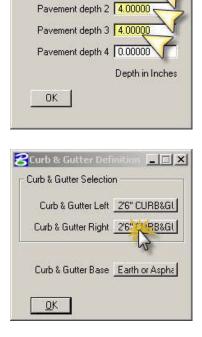
Finished Typical drawn with Typical Section Generator for Exercise 2

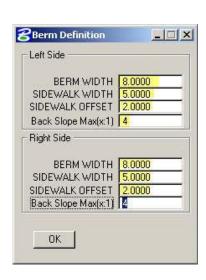
8 Pavement Depth

Pavement depth 1 3.00000

These dialog boxes were used to create the typical for the Exercise 2







Close the U2457_rdy_typ.dgn design file.

REV. DATE 06/05/2007

Referencing Design Files

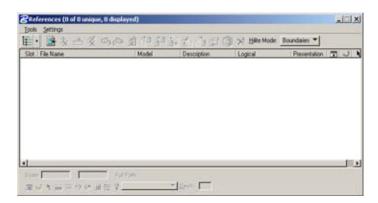
Dialog Box Method

Open the U2457_rdy_psh_lay.dgn design file.



Step 1.

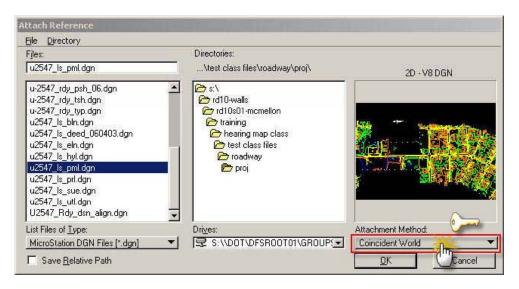
Select the **References** Tool Box from the Primary Tool Family





Step 2.
After the dialog box opens select Tools then Attach

Step 3. Choose the **u2547** ls pml.dgn design file.



Step 4.Set your attachment method to **Coincident World.** Then select **OK** to attach the file.



Note:

The attachment method for design files needs to be set to **Coincident World**.

Referencing File Models (Coincident, Coincident-World, and Interactive)

What is the recommended referencing method proposed by Roadway CADD Support? Coincident World

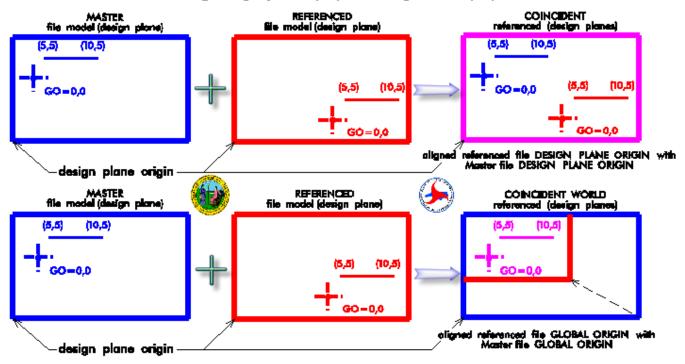
What is the difference between Coincident, Coincident World, and Interactive Referencing? coincident – attaching the referenced file Default model where its DESIGN PLANE ORIGIN is aligned with the master file model DESIGN PLANE ORIGIN. If there is a global origin difference between the two file models, then the referenced elements are not coordinately correct with respect to the master file model.

coincident world— attaching the referenced file **Default** model where its **GLOBAL ORIGIN** is aligned with the master file model **GLOBAL ORIGIN**. If there is a global origin difference between the two file models, then the referenced elements **ARE** coordinately correct with respect to the master file model.

(continued on Next page)

attachment methods

referencing design planes (2D) and design cubes (3D)



interactive – option to reference other models, not just the **Default** model. Coincident and Coincident world attachment methods will still have to be selected. Other options include the ability to key-in logical names and setting live nesting depths.

What is the referenced file model LOGICAL NAME used for?

For regular plan production, specific logical names for the referenced plannametric files will plot out light or shaded underneath the dark solid DSN and master PSH file models.

Exercise 3: Attach the following files shown below to the U2457_rdy_psh_lay.dgn design

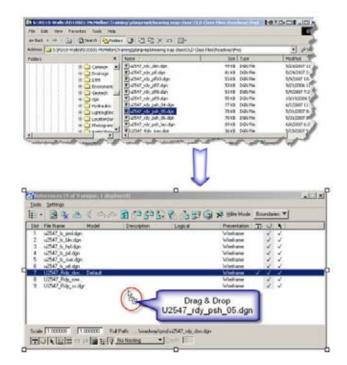
- 1. U2547_rdy_ss.dgn
- 2. U2547_rdy_row.dgn
- 3. U2547_rdy_dsn.dgn
- 4. U2547_ls_hyl.dgn
- 5. U2547 ls utl.dgn
- 6. U2547 ls sue.dgn
- 7. U2547_ls_prl.dgn
- 8. U2547 ls bln.dgn

Note:

You may also select multiple files at once when attaching them to your design file.

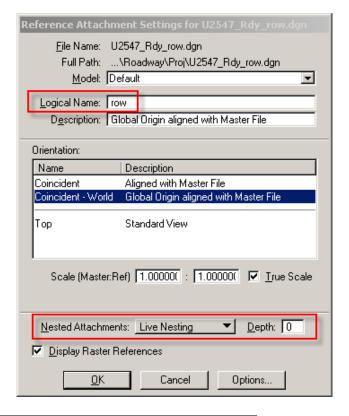
REV. DATE 06/18/2007

Drag & Drop Method



Reference Files can also be attached with the **Drag & Drop** Method from Windows Explorer.





Note:

The **interactive method** will allow you to key in your logical name when attaching the reference file. This is the only thing that should be changed. The Nested Attachments should not be changed.

Close the U2457_rdy_psh_lay.dgn design file.

Draw A Profile Using Geopak Draw Profiles

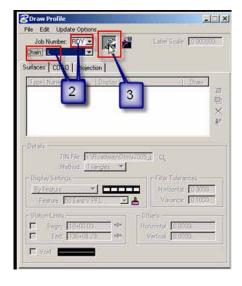
PART I. Existing Ground Profile

Open the U2457_rdy_pfl.dgn design file.



Step 1.

From the **Geopak Road** Tool Frame select the **Plan Preparation** Tool Family then select the **Draw Profiles**Tool Box



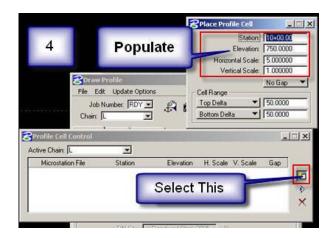
Step 2.

Put in RDY for your Job Number and L for the Chain

Step 3.

Select the **Dialog Profile Cell Control** icon





Step 4.

After **Profile Cell Control Dialog** box opens, choose the top button as shown on the left.

Populate the **Place Profile Cell Dialog Box** as shown on left except use **550**° for the elevation. Then place the profile.



Result of Step 4.

NOTE:

There are various methods of placing place the cell. Some may place it directly on a profile plan sheet while others may place anywhere in the file and work on their profile afterwards.

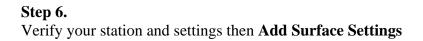


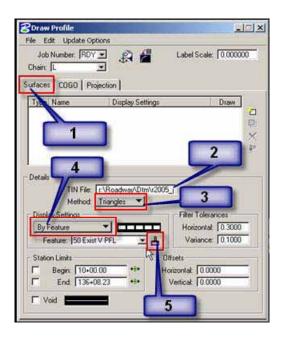
Profile information is added here.

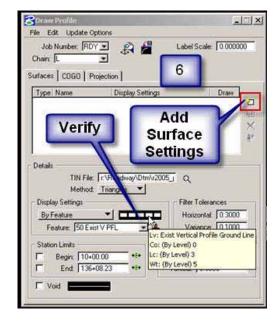
Step 5. (Prepare Settings for Existing Ground Profile)

- 1. Select the **Surfaces** tab
- 2. Set the Tin File to **u2547_ph_tnp_040525.tin**
- 3. Set the Method to **Triangles**
- 4. Set the Display Setting to **By Feature.**
- 5. Click on the Paint brush to set the Feature to **50 Exist V PFL Vertical Profile Draw Box as shown below.** (Make sure you are reading from NCDOT ddb file).





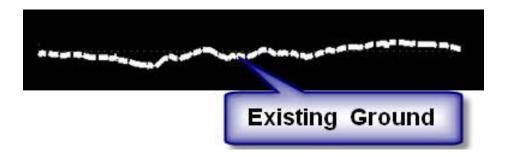




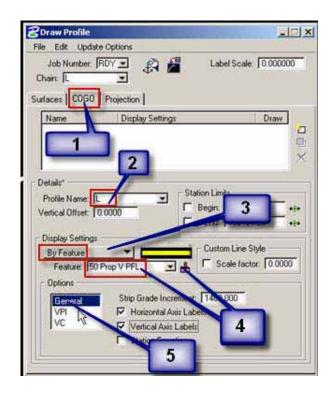
Step 7.Saves your Existing Profile Settings in COGO



Existing Ground profile will be plotted out similar to the one shown below.

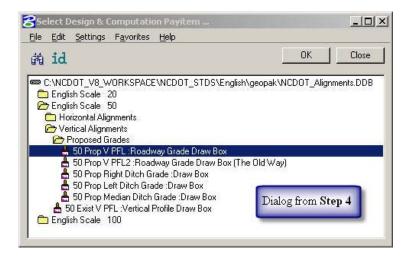


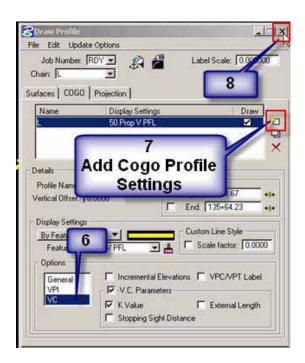
PART II. Proposed Profile



Step 1. (Prepare Settings for a Proposed Profile)

- 1. Select the **COGO** tab
- 2. Set your Profile name to **LPRO**
- 3. Set the Display Setting to **By Feature**
- 4. Click the Paint brush Set the Feature to **50 Prop V PFL Roadway Grade Draw Box**
- 5. Set your **Options** for **General** as shown on the left for the **VPI** option toggle on VPI & Grade Labels.

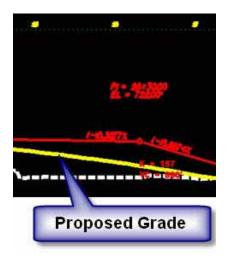




Step 2. Draw the Proposed Profile

- 6. Set your **Options** for **VC** as shown on the left.
- 7. Add your Cogo Profile Settings
- 8. Close

The Proposed profile will be plotted out similar to the one shown below.



Exercise 5: Draw an existing and proposed profile for Chain Y.

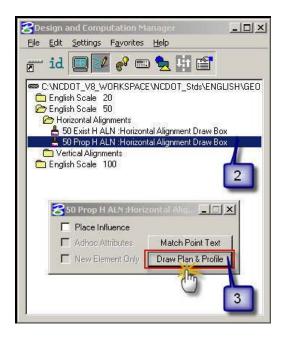
Close the U2457_rdy_pfl.dgn design file.

Draw An Alignment Using Geopak D&C Manager

Open the U2547_rdy_dsn.dgn design file.



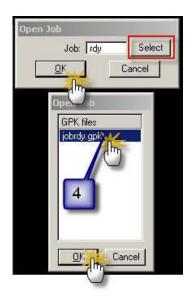
Step 1. On the NCDOT_DDB Tool Frame select the Alignment D&C Manager Tool Box.



Step 2.

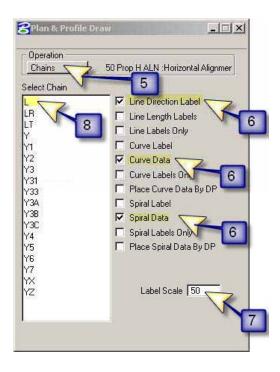
Path to the option for a 50 Scale English Proposed Horizontal Alignment and select this option.

Step 3.Next select **Draw Plan & Profile**



Step 4.

Select **jobrdy.gpk** for the Job.



Step 5.

Set the Operation to Chains.

Step 6.

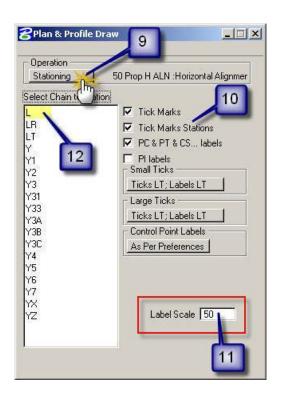
Verify what options you want drawn are checked on.

Step 7.

Verify the **Label Scale** has been set to your desired scale in this example $\underline{50}$ is the setting.

Step 8.

Now proceed to selecting the chain you want drawn in the design file, for this example use ${\bf L}$.



Step 9.

Set the Operations to **Stationing**.

Step 10.

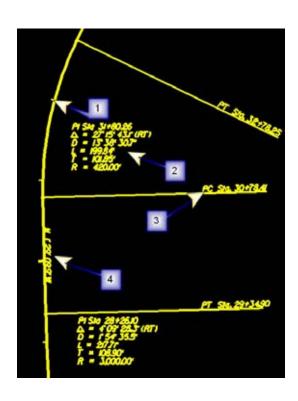
Verify what options you want drawn are checked on.

Step 11.

Verify the **Label Scale** has been set to your desired scale in this example **50** is the setting.

Step 12.

Select the chain you want to station, for this example use L.



Exercise 4: Draw and Station Chains Y, Y1, Y2

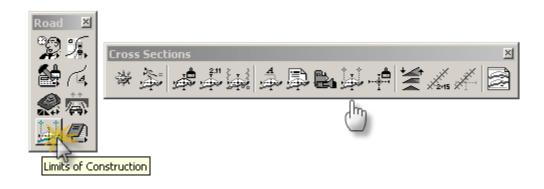
Close the U2457_rdy_dsn.dgn design file.

- 1. Station Tick Marks
- 2. Curve Data
- 3. Station of Chain
- 4. Line Direction Label (Bearing)

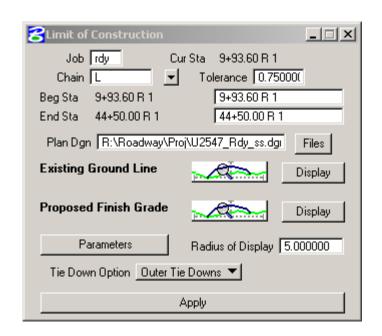
Limits of Constructions

Open the U2547_rdy_xsc_l.dgn design file.

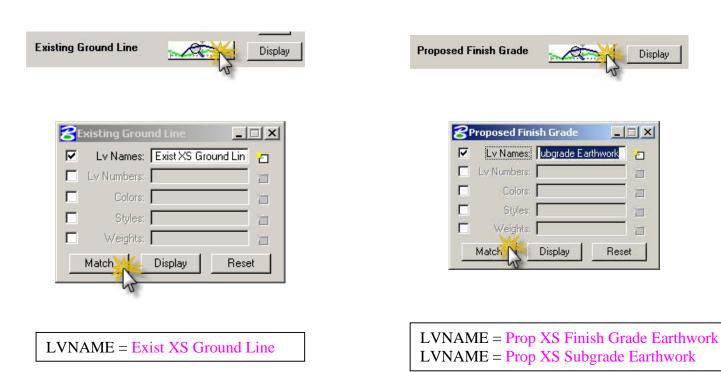
Step 1.From the **Geopak Road** Tool Frame select the **Cross Section**Tool Family then select the **Limits of Construction** Tool Box



Step 2. Populate the dialog box as shown below be sure to set the **Plan Dgn**.

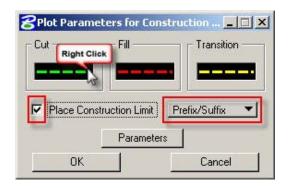


Step 3.Set the Level name for the Existing Ground Line and Proposed Finish Grade



Step 4.

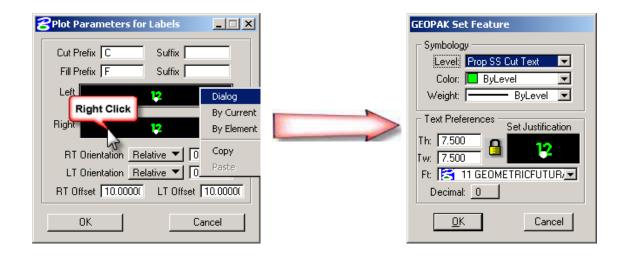
Set the Level name for the Construction Limits by right clicking in black area then selecting dialog. Check on **Place Construction Limit.** Next change the setting to **Prefix\Suffix.**



Cut LVNAME = Prop SS Cut Line
Fill LVNAME = Prop SS Fill Line
Transition LVNAME= Prop SS Transition Line



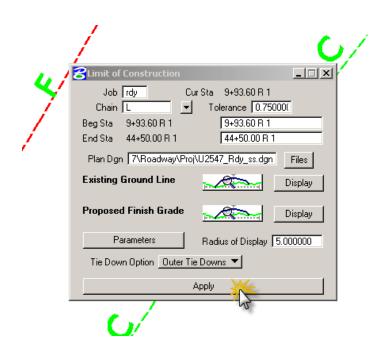
Step 5.Set the Parameters for the Construction Limits **Text** by clicking on **Parameters.**



Note:

Due to Current limitation of Geopak only allowing one level for the cut or fill use the Prop SS Cut Text level name for both the Left and Right.

Step 6. Select **Apply** to draw the Limits of Construction in the U2547_rdy_ss.dgn file.



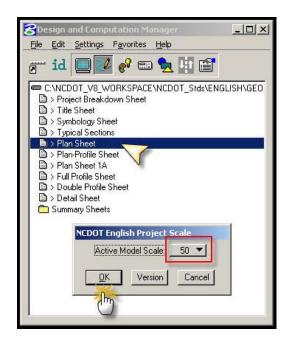
Plan Sheet Layout

Open the U2457_rdy_psh_lay.dgn design file and turn off all Reference files except U2547_rdy_dsn.dgn.

Step 1. Retrieve a 50 Scale Plan Sheet Cell



From the **NCDOT_STDS** Tool Frame pull off the **NCDOT_DDB** Tool Family and select the **DESIGN SHEET D&C** Tool Box

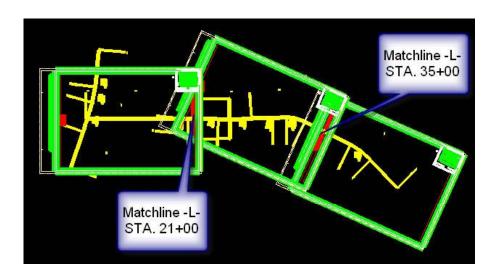


Select Plan Sheet then set your scale to 50

Step 2. Place the Plan Sheets Cell(s)

Note:

Rotate your view for each Plan Sheet before placing each individual sheet.



Note:

Use Rotate View by Two Points to rotate the view.





Close the U2457_rdy_psh_lay.dgn design file.

Step 3. Clip the Plan Sheet

Open the **U2457_rdy_psh_04.dgn** design file. All Reference files have been referenced for you for the purpose of the class.



Note:

This is the actual Level Name to be used for the Matchline & Clip Elements shown above.

Note:

Matchlines are drawn **Perpendicular** to the alignment at an **Even** Station We recommend using a station length of **1400**' between the two matchlines. Regardless of the station length used be sure your plan sheet and profile sheets use the same station length when cutting your sheets.



Step 3-A. Drop the Sheet Clip Boundary Cell



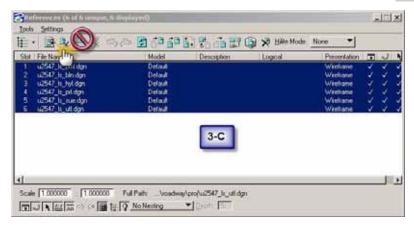
Step 3-B. Open the **References** Dialog Box

Step 3-C.

Select all your Reference Files then Use Clip Reference



to clip the reference files.



Note: Using Clip Mask



will set you up for failure when plotting. Do not use.



Step 3-D.

Set it to **Element** to clip using the **Sheet Clip Boundary Cell.** This setting will also allow you to clip the reference files dynamically (On the Fly) by using the MicroStation "modify" button.

Note:

The **Geopak Plan & Profile Sheet Layout Tool** shown below is another method for laying out Plan Sheets. The help files are on the Roadway Web Page are being updated to our current practice.





From the **Geopak Road** Tool Frame select the **Plan Preparation** Tool Family then select the **Plan Profile Sheet Composition** Tool Box



Close the U2457_rdy_psh_04.dgn design file.

Iplot Organizer-Plan Sheets



Step 1. Open **Iplot Organizer** then cancel out of first dialog box.



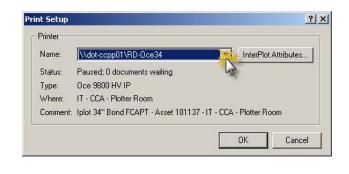


Note: Be sure **not** to open the **Microstation J** version of Iplot Organizer

Step 2. Set the **Printer** you will be using.







Step 3. Drag and drop the Plan Sheet Design File(s) into Iplot Organizer

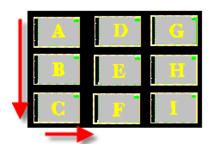




Note:

This method will only work with design files that contain only one Sheet Cell. Profile and typical design files usually contain more than one Sheet Cell in the same design file; therefore this method will not work unless you use the "profile" set file. The sheets must be placed in Top view in order from Top to Bottom and then from Left to Right (shown below). After the files are in iplot organizer you will need to change the plot name to what you need. Another method for using iplot organizer will be shown later during the XPL section of the class.

Step 4. Select your **Settings File**



Note: Path for Settings file is C:\NCDOT_V8_WORKSPACE\ROADWAY_STDS\English\plot\FullSize SET



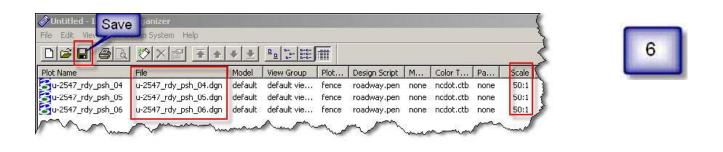




Step 5.Select **Close** on the dialog box and the settings will be applied.



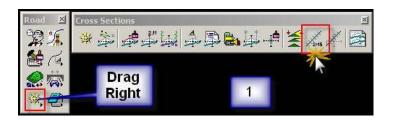
Step 6.
Be sure to select SAVE and save the file as u2547full.ips



Exercise 6: Create a new Iplot Organizer half size set using the same design files. Save file as u2547half.ips.

Generate Existing Ground X-Sections Using Pattern Lines

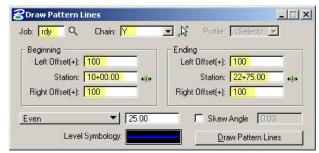
Open the **U2547_rdy_pat_y.dgn** design file.



Step 1.

From the **Geopak Road** Tool Frame select the **Cross Sections** Tool Family then select the **Draw Patterns By Station Range** Tool Box





Step 2.

Populate the dialog box below to set the pattern line parameters.

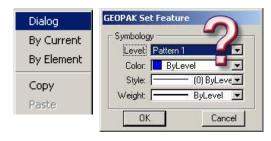




Step 2A.

Select the pattern line type





Step 2B.

Right click in the **Level Symbology** field and select **Dialog** to set the level symbology.



Step 3. Draw the Pattern Lines

Note:

After the additional (**Once**) X-sections pattern lines have been placed, the pattern lines placed by **Station Range** should be evaluated for proximity to them. If the **Station Range** pattern line is within **10'** (+/-) of an additional (**Once**) pattern line, then the **Station Range** pattern line may be eliminated. The additional (**Once**) pattern line should always take precedence.

NOTES ABOUT PATTERN LINES:

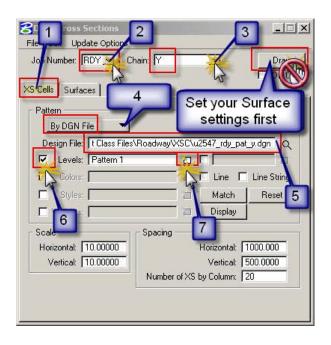
- 1. Pattern lines are normally drawn at **Even** 50' station increments or a station **Increment** as determined by project situation.
- 2. Horizontal Control Points (ST, TS, PT, PC, etc.)
- 3. Use the **Once** Setting for the following:
- All pavement transition points for instance any place the pavement widens or narrows should be picked up with an additional pattern line.
- Centerline of box culverts or large streams
- Bridge Ends
- Retaining Walls
- Ends of Radius at Intersections : At both Mainline and Y Lines
- Mainline & ramp gore area ties

Step 4.

Close the U2547_rdy_pat_y.dgn design file and open the U2547_rdy_xsc_y.dgn design file.



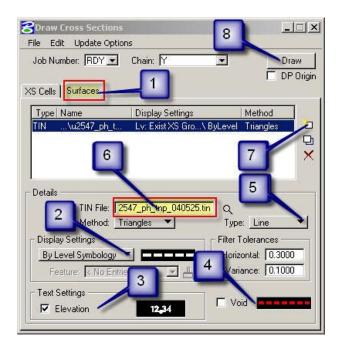
Step 5.From the Geopak Road Tool Frame select the Cross Sections Tool Family then select the Draw X-Section from Surfaces Tool Box



Step 6.

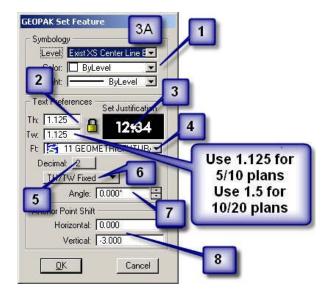
Set your **XS CELLS** settings

- 1. Verify you are on the **XS CELLS** Tab
- 2. Select **RDY** for the **Job Number**
- 3. Select **Y** for the Chain
- 4. Change from By Station to By DGN File
- 5. Set the Design File to **u2547_rdy_pat_y.dgn**
- 6. Toggle on **Levels**
- 7. Set Level Name to **Pattern 1**





Existing Ground Settings



Elevation Settings

Step 7.

Set your **Surface** Settings then draw the X-Sections

- 1. Select the **Surfaces** tab
- Right click in the Level Symbology field and select Dialog to set the level symbology as shown in 2A below
- 3. Toggle on **Elevation** and change the settings as shown in **3-A** below
- 4. Toggle on **Void** to change settings as shown **in 4A** below
- 5. Verify the Type is **Line**
- 6. Set your TIN File to **u2547_ph_tnp_040525.tin**
- 7. Add the **Surface**
- 8. **Draw** your X-Sections



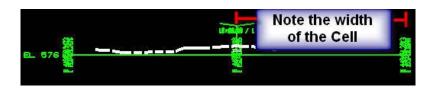
Void Line Settings



Existing Ground X-Section

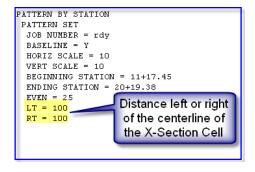
REV. DATE 06/05/2007

Generate Proposed X-Sections & XPL's



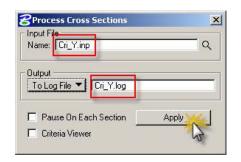
Note:

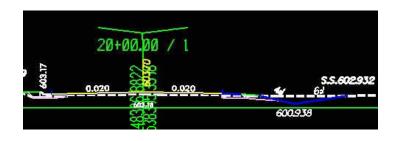
The distance in the X-Section design file should match the distance in your criteria file



Step 9.

Load the **Cri_Y.inp** criteria file to create the proposed X-Sections.





Step 10.

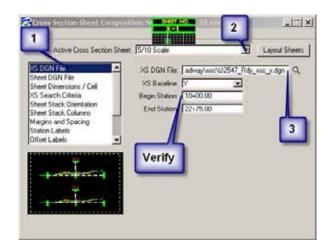
Close the U2547_rdy_xsc_y.dgn design file and open the U2547_rdy_xpl_y.dgn design file.



Step 11.

From the **Geopak Road** Tool Frame select the **Cross Sections** Tool Family then select the **Cross Section Sheet Composition** Tool Box

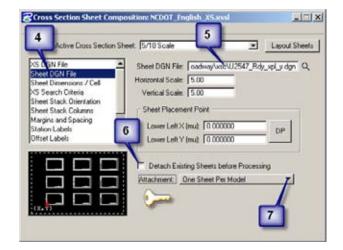




Step 12.

Set your X-Section Design File Parameters as shown:

- 1. Set to XS DGN
- 2. Set to **5/10 Scale** (75' Left or Right)
- 3. Select the X-Section U2547_rdy_xsc_y.dgn



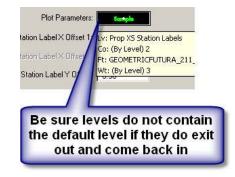
Step 13.

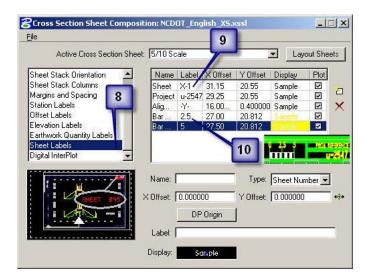
Set your XPL Design File Parameters as shown:

- 4. Set to Sheet DGN File
- 5. Select the X-Section U2547_rdy_xpl_y.dgn
- 6. **Uncheck** the Detach Existing Sheets before Processing
- 7. Change to **One Sheet Per Model**



Note: Verify your levels are not on the default level

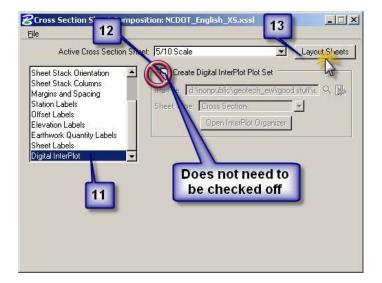




Step 14.

Set your Sheet Labels as shown:

- 8. Set to Sheet Labels
- 9. Set the sheet parameters
- 10. Verify your **Bar Scale** settings



Step 15.

Uncheck Digtal Interplot:

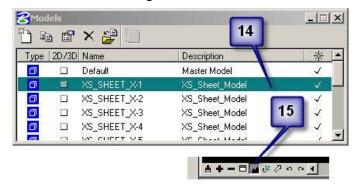
- 11. Set to **Digital InterPlot**
- 12. Verify it is Unchecked
- 13. Layout the XPL Sheets





Step 16.

Click on the Model Icon to Navigate through your XPL Sheets or use the Model Navigator



- 14. Double Click to go to Sheet X-1
- 15. Fit View

Iplot Organizer-XPL Sheets

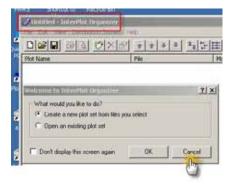
Step 1.

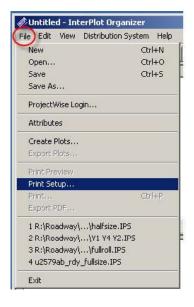
Open **Iplot Organizer** and cancel out of first dialog box.

Note: Be sure **not** to open the **Microstation J** version of Iplot Organizer









Step 2.
Set the **Printer** you will be using



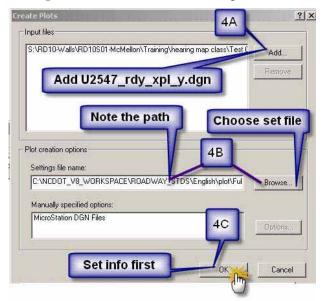






Step 3.
Create Plots. Under Iplot Organizer go to File then Create Plots.

Step 4. Populate the Create Plots dialog box



- 4A. Add the U2547_rdy_xpl_y.dgn to the Input files field
- 4B. Choose your **Settings File**

Path for Full Size use

 $C:\NCDOT_V8_WORKSPACE\ROADWAY_STDS\English\plot\FullSize\ SET$

Path for Half Size use

 $C:\NCDOT_V8_WORKSPACE\ROADWAY_STDS\English\plot\HalfSize\ SET\$

4C. Verify all your info has been set, now select \mathbf{OK} and the settings will be applied.







Step 5. Be sure to select **SAVE** before exiting.

